SNIA DEVELOPER CONFERENCE
SDC 25
By Developers FOR Developers

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Advancing the AI Factory Sustainability

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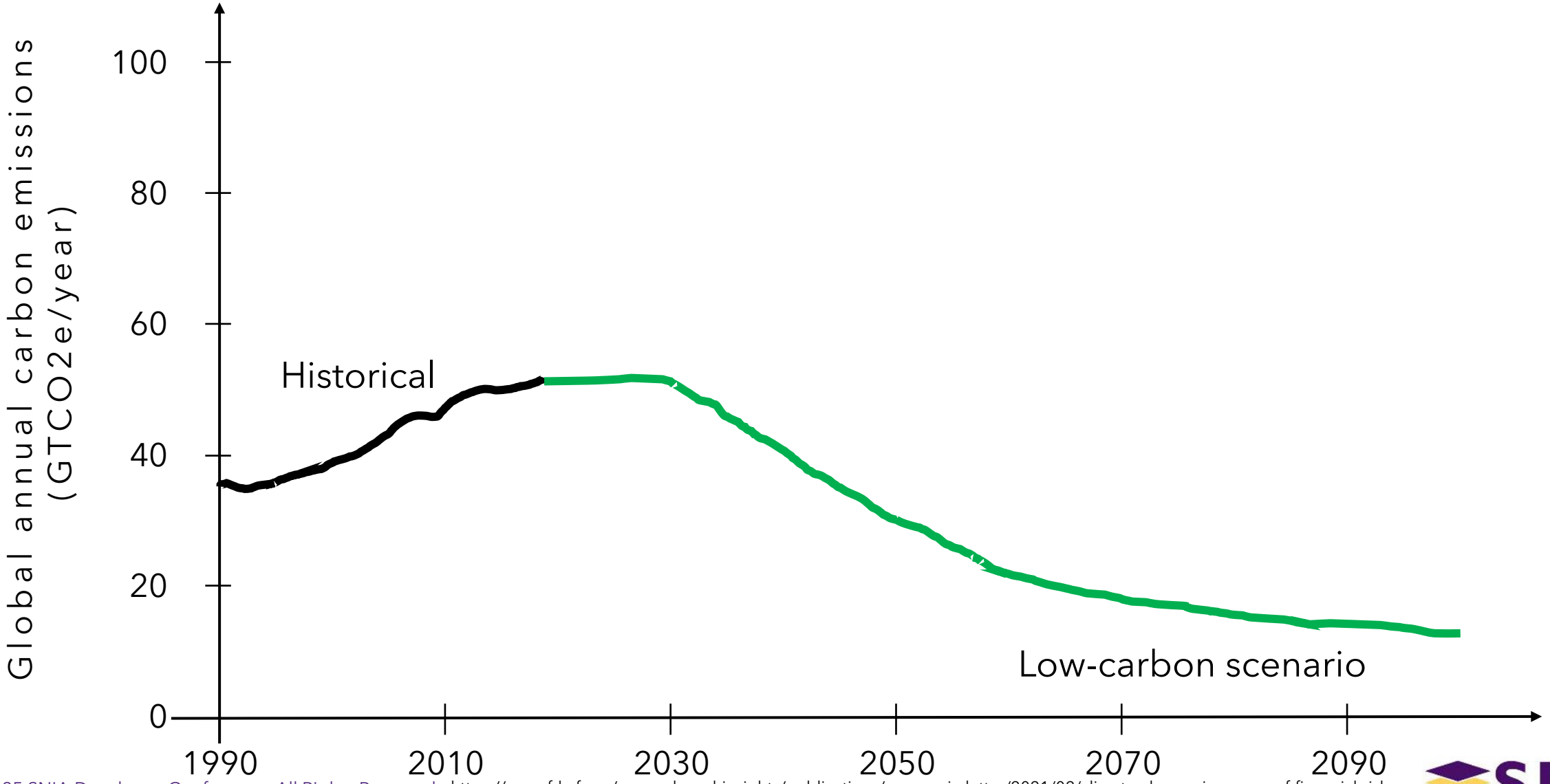
2016 Paris Agreement

1.5°C

Heat waves Artic ice thaws Ocean changes Rising Seas Floods and droughts Species loss

Our Path Forward



https://www.frbsf.org/research-and-insights/publications/economic-letter/2021/02/climate-change-is-source-of-financial-risk

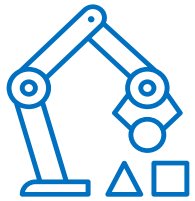
Our Carbon Footprint

Product Use

The use of the products we sell produces emissions accounted for in Scope 3. This includes emissions from the energy our products consume during customer use.

70%

Procurement and Product Manufacturing



Manufacturing and warehousing of Cisco components, products, and services produce upstream emissions that are accounted for in Scope 3.

23%

Logistics

Transportation and distribution of our products in the value chain produce emissions that are accounted for in Scope 3.

5%

Direct Operations

Emissions from the operation of Cisco facilities (electricity, fuel for heating and cooling, etc.) are accounted for in Scope 1 & 2.

<1%

Scope 3

Scope 1 & 2

SOURCE: Cisco FY23 Purpose Report. NOTE: Other value chain activities (e.g. waste and business travel) are also accounted for in Scope 3, but do not represent a large share of emissions. Percentages shown may be rounded.

Sustainability: A Business Imperative

 Twin transition: sustainable and digital	73%	of CxOs say becoming a “truly sustainable and responsible business” is a top priority[1]
 Customer, investor and employee demand	68%	of consumers say environmental sustainability is extremely or very important to them[2]
 Legislation, regulatory requirements, reporting standards, scrutiny	150	countries have a net zero target as of July 3, 2023 [3]
 Business efficiencies and opportunities (e.g., public funding)	62%	of companies worldwide believe investments in IT are very or extremely important to reach sustainability goals[4]
 AI is pushing infrastructure requirements	$500B	Estimated CAPEX spend by 2027 in Data Center physical Infrastructure[5]

Transforming Data Center Infrastructure

Optimize efficiency, visibility, performance and cost across your networking and compute infrastructure

Build

Decrease Energy Consumption

Solutions designed with less energy and resources, reducing waste in systems

Deploy

Increase Energy Efficiency

Modern architectures enabling consolidation, power and cooling optimization and future-readiness

Operate

Cloud Managed Sustainability

Real-time visibility of energy consumption, and workload and resource optimization

Energy Consumption in Data Centers

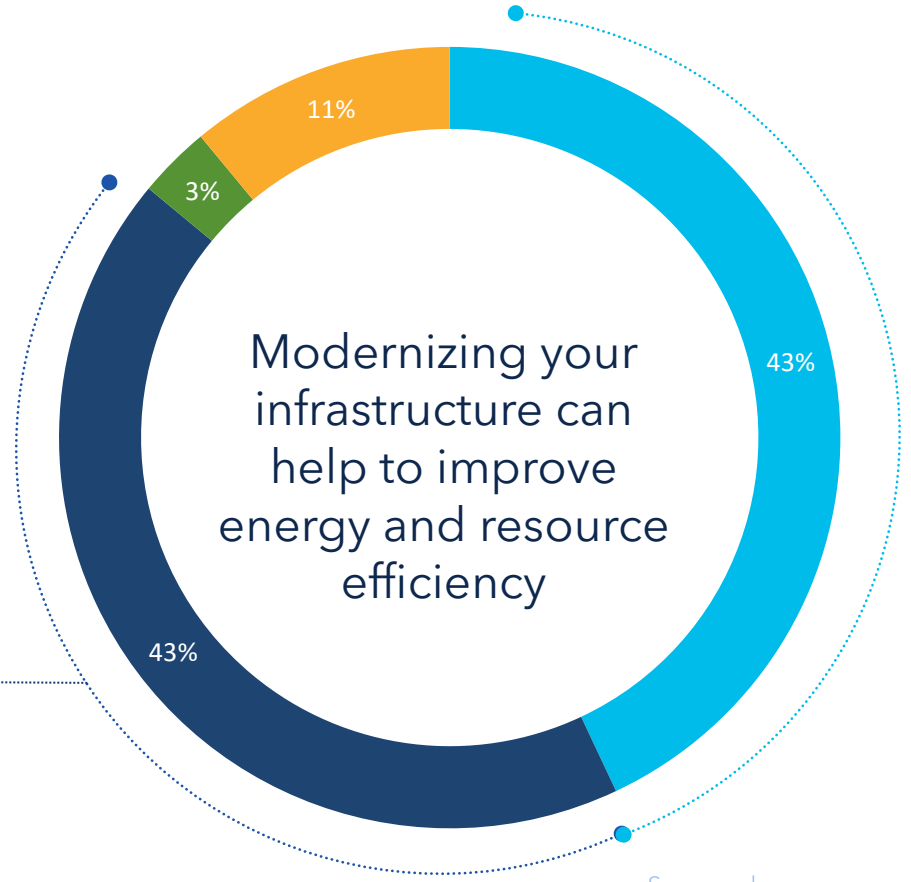
Data centers represent
1-2% electricity use globally[1]

2021: 200 terawatt hours (TWh) per year
2030 Growth Estimate: 3,000 (TWh) per year

- Servers
- Chillers, Fans & pumps
- Network
- Storage

86%

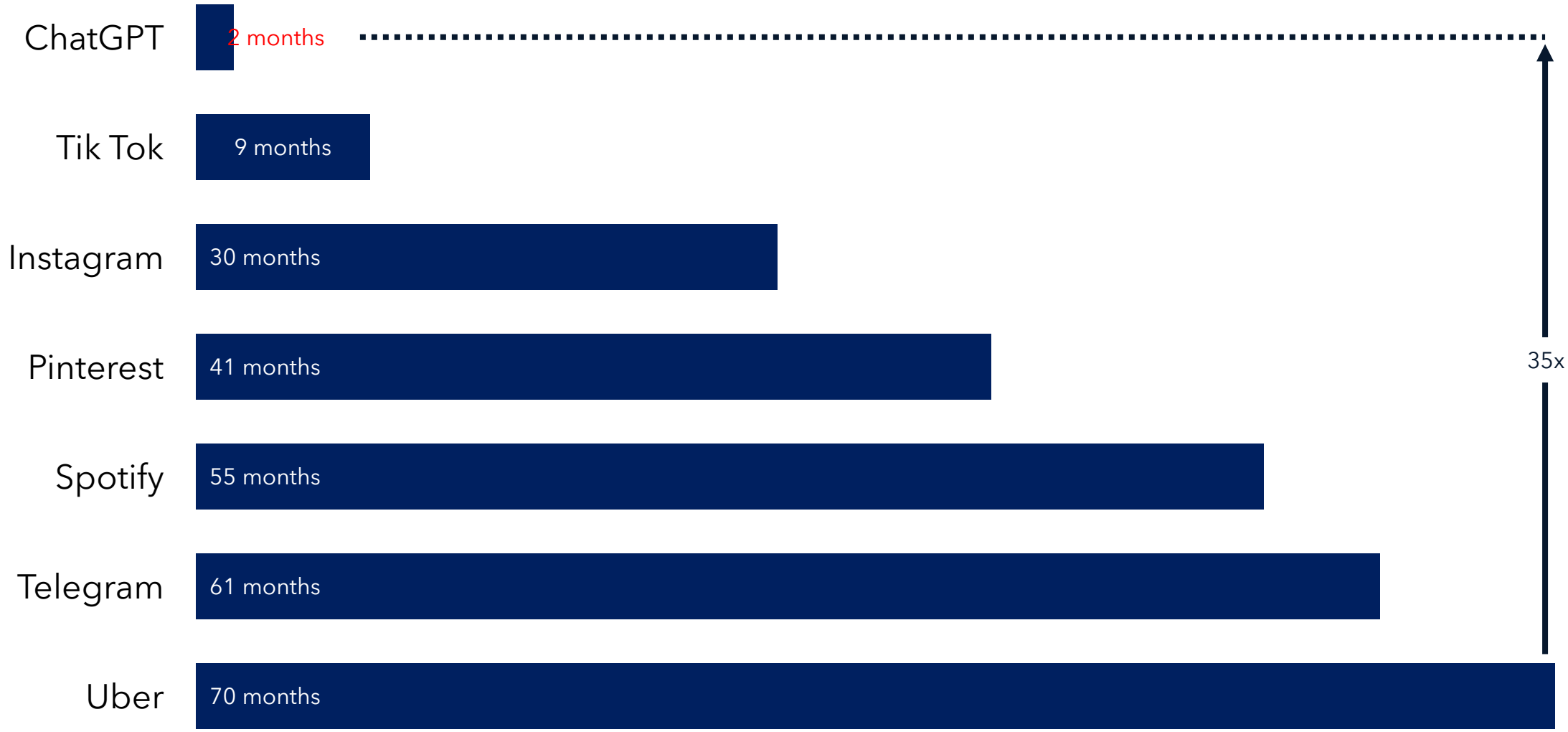
Cooling, power systems & servers



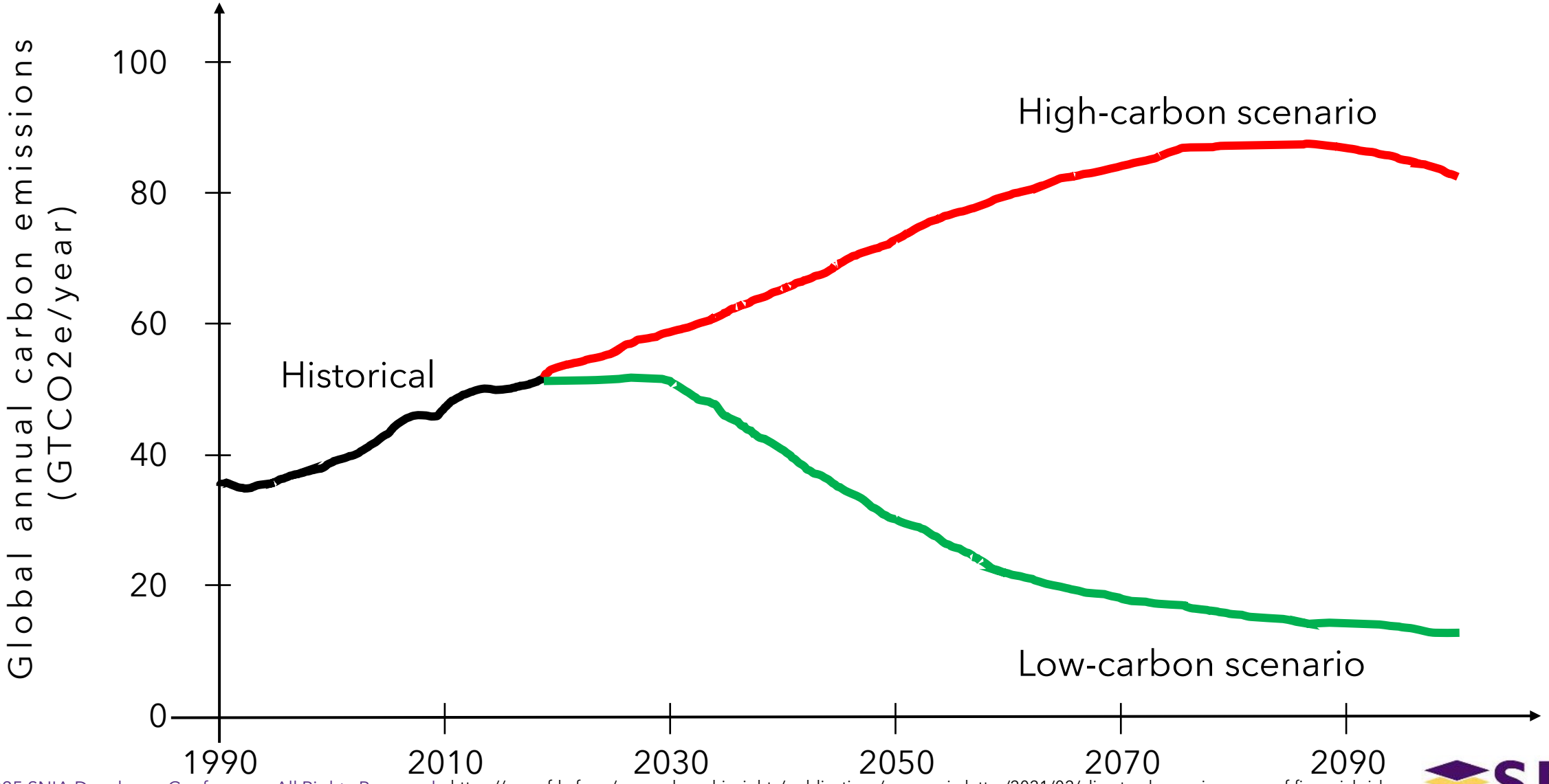
Source: akcp.com

[1]https://www.iea.org/energy-system/buildings/data-centres-and-data-transmission-networks

100 Million Active Users



Our Path Forward



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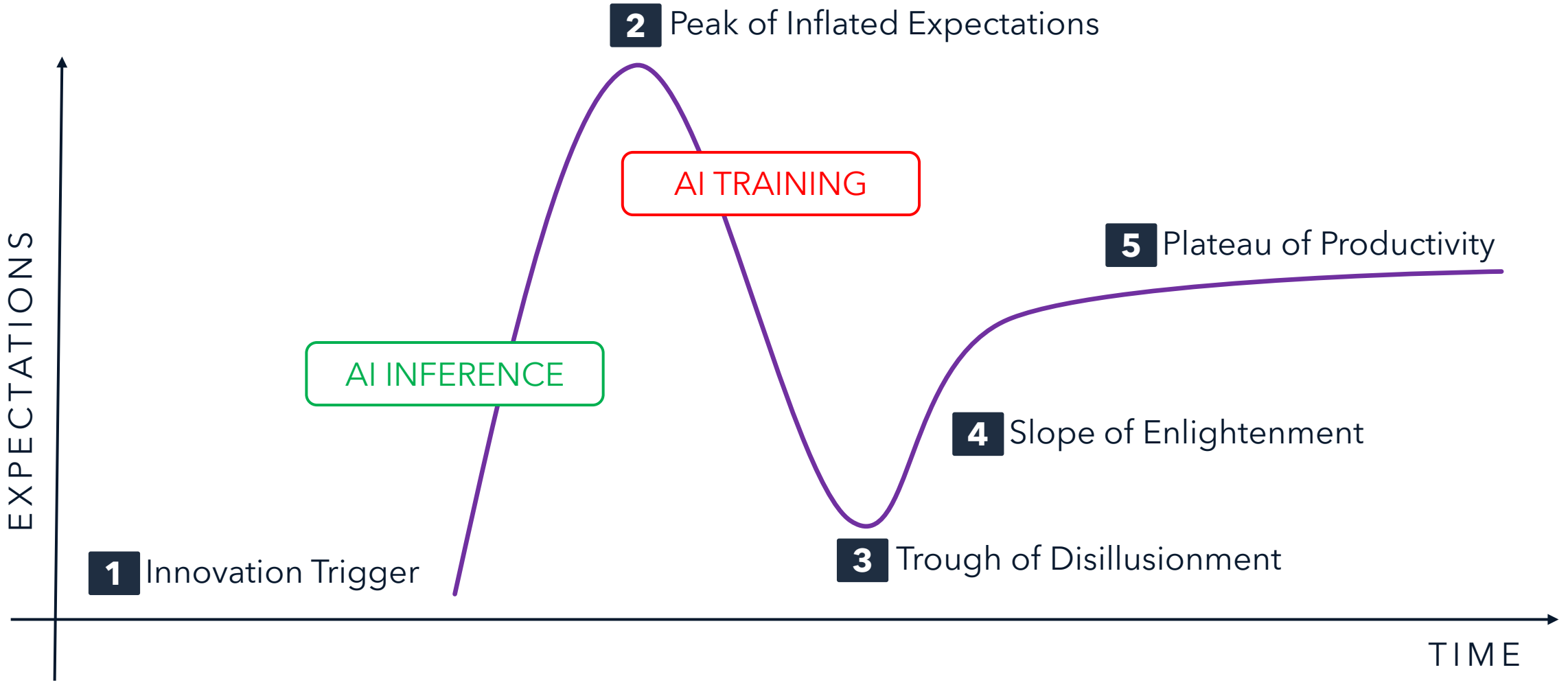
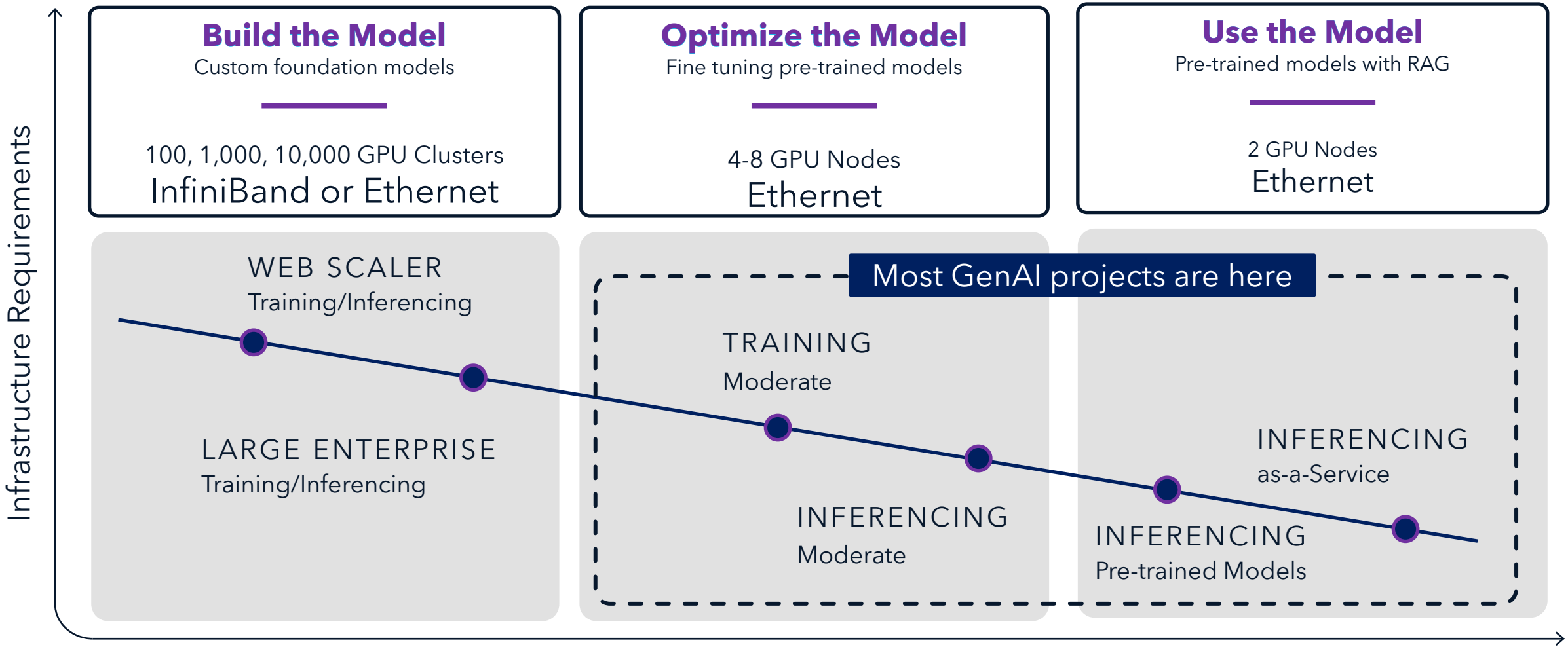
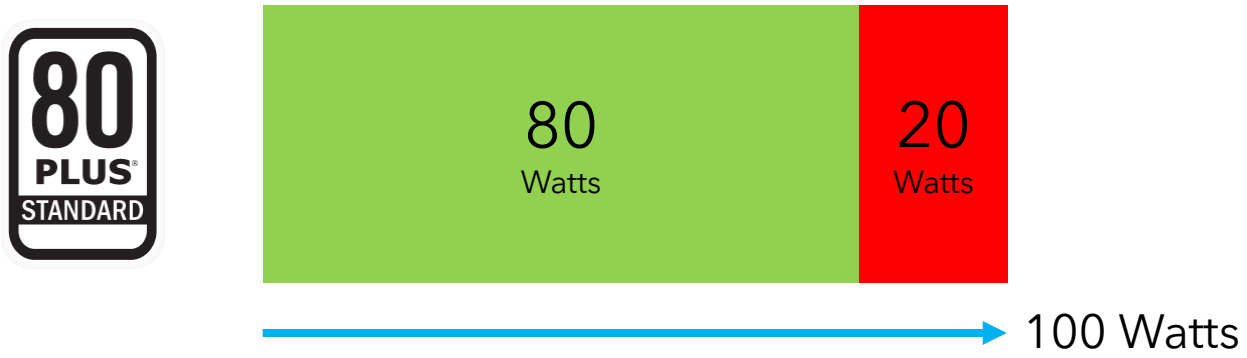
Where Are We Today?

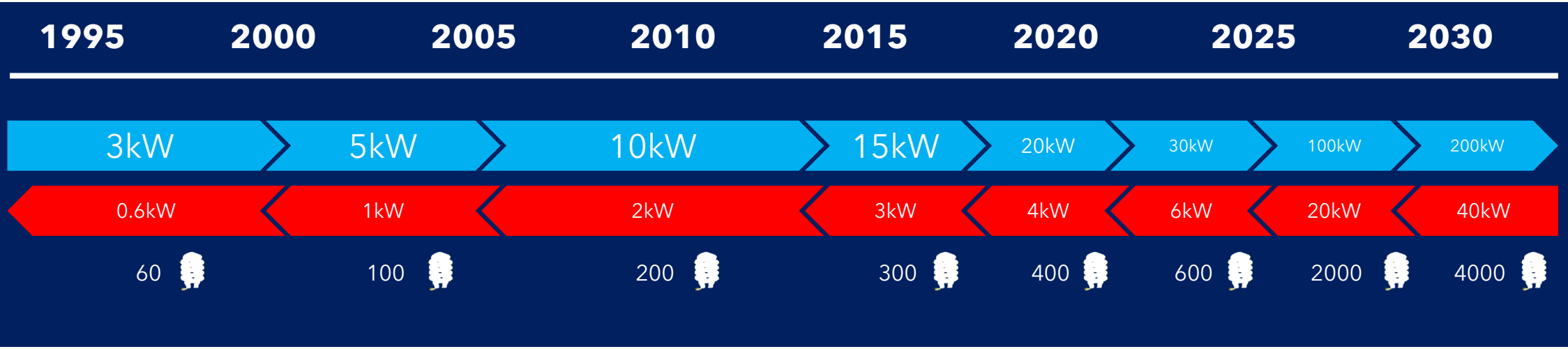


Generative AI Spectrum

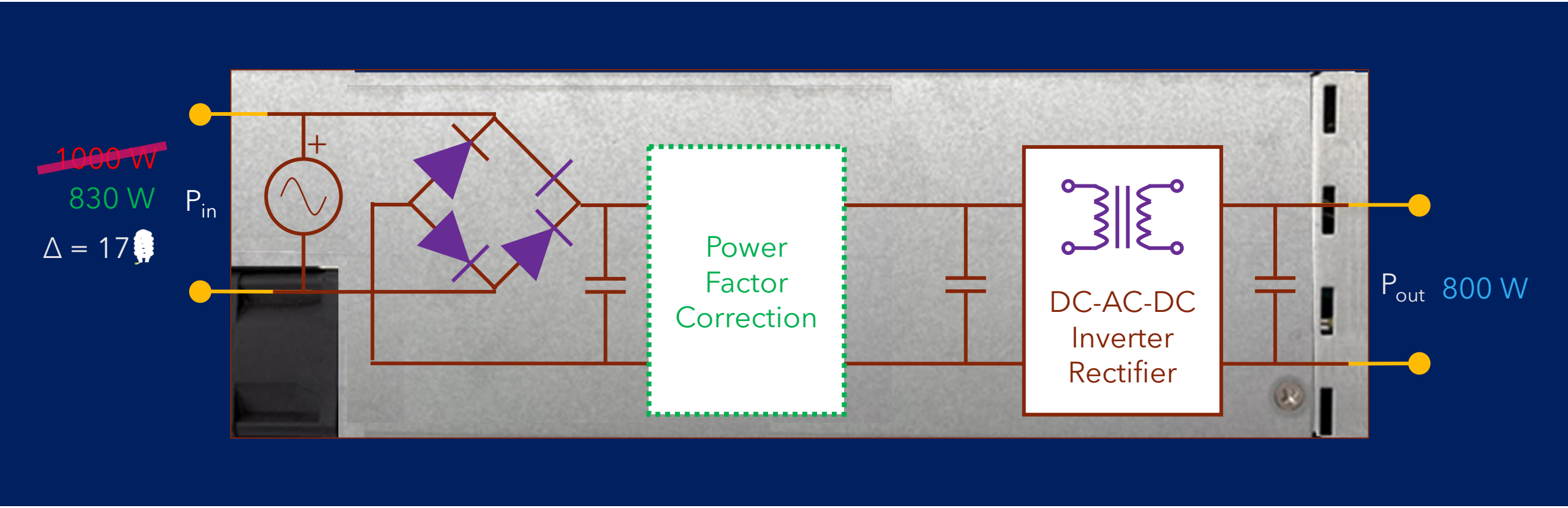


More We Use, More We Waste



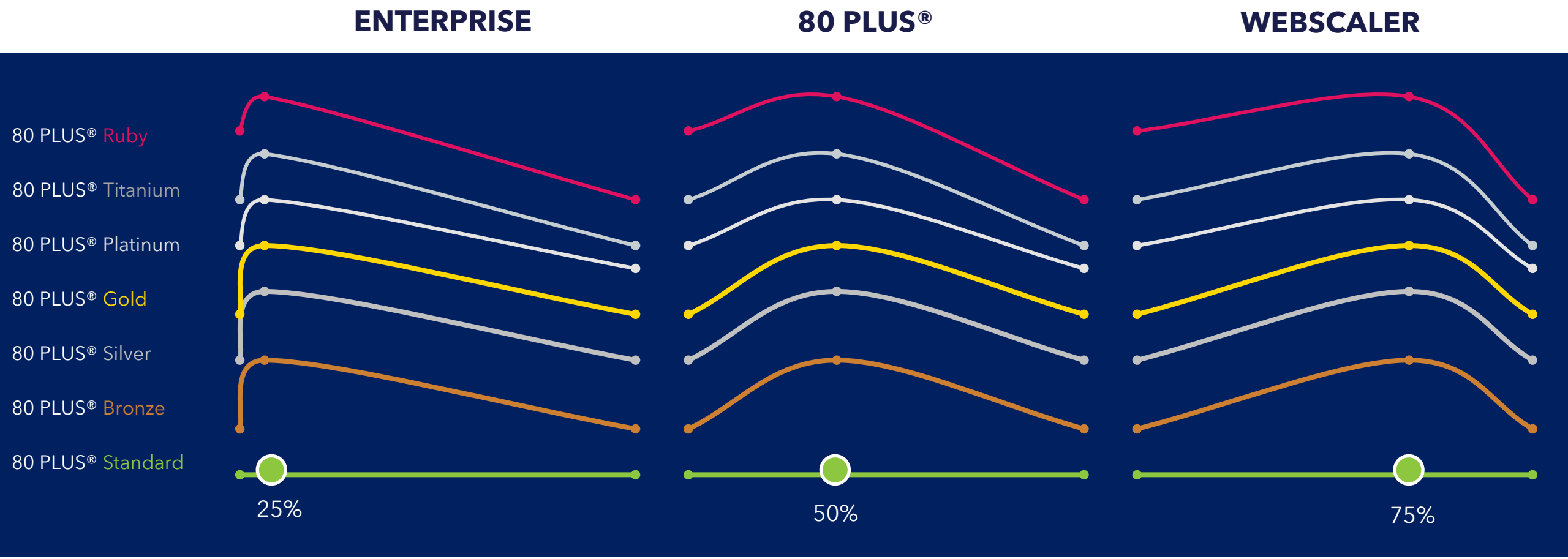


Power Efficiency Consideration



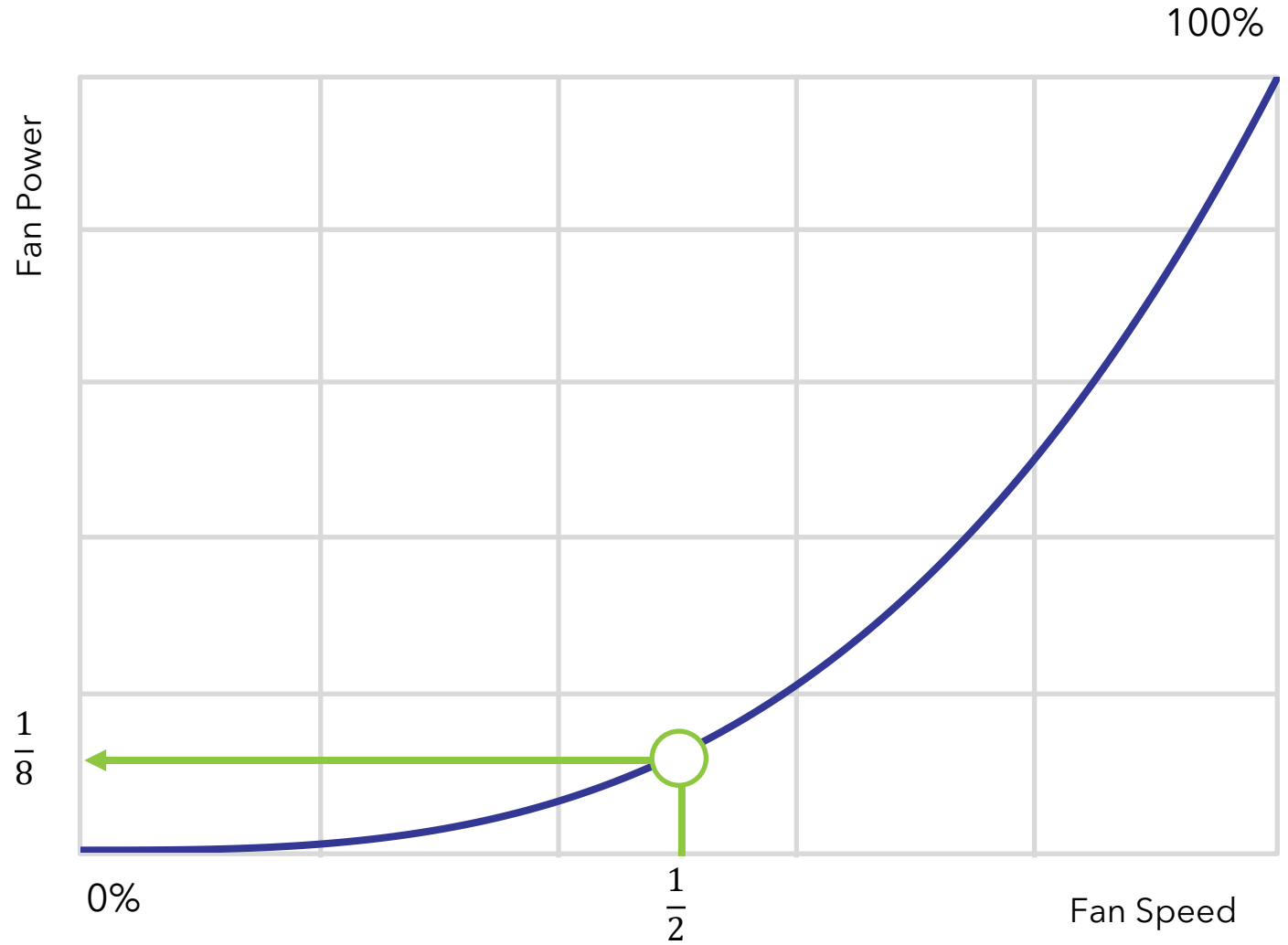
Adopt the Highest Efficient Power Supply

Tune Power Supply for Your Use Case



More We Use, More We Waste

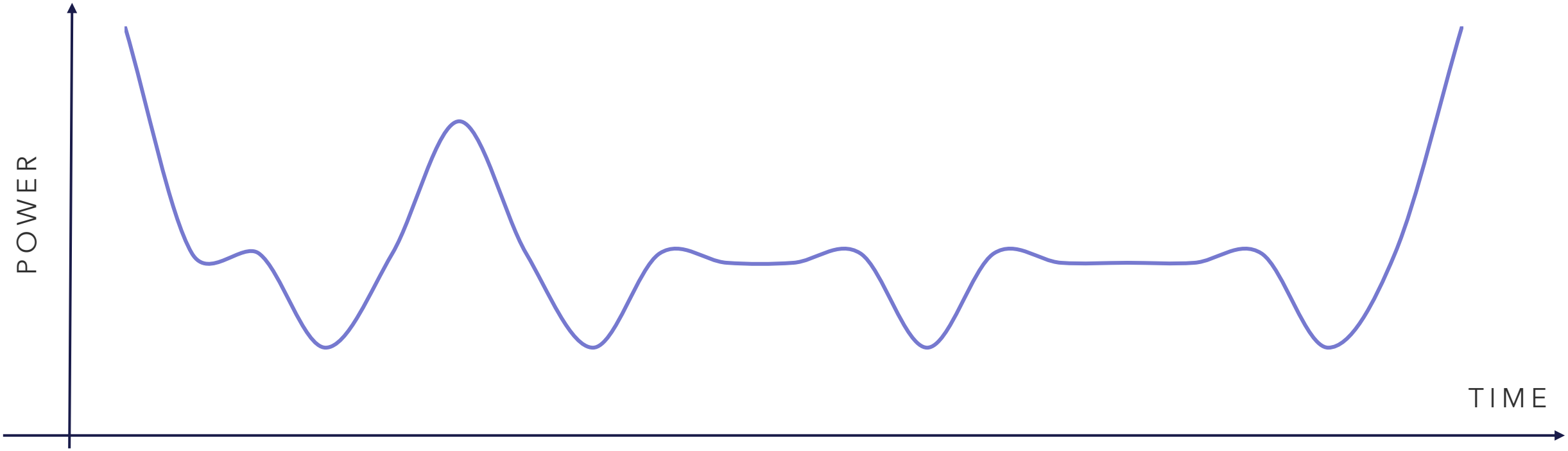
$$Fan\ Power \propto (Fan\ Speed)^3$$



Standard Proportional Integral Derivative

$$u(t) = K_p e(t) + K_i \int_0^t e(\tau)\,d\tau + K_d \frac{de(t)}{dt} + K_u \frac{dU(t)}{dt}$$

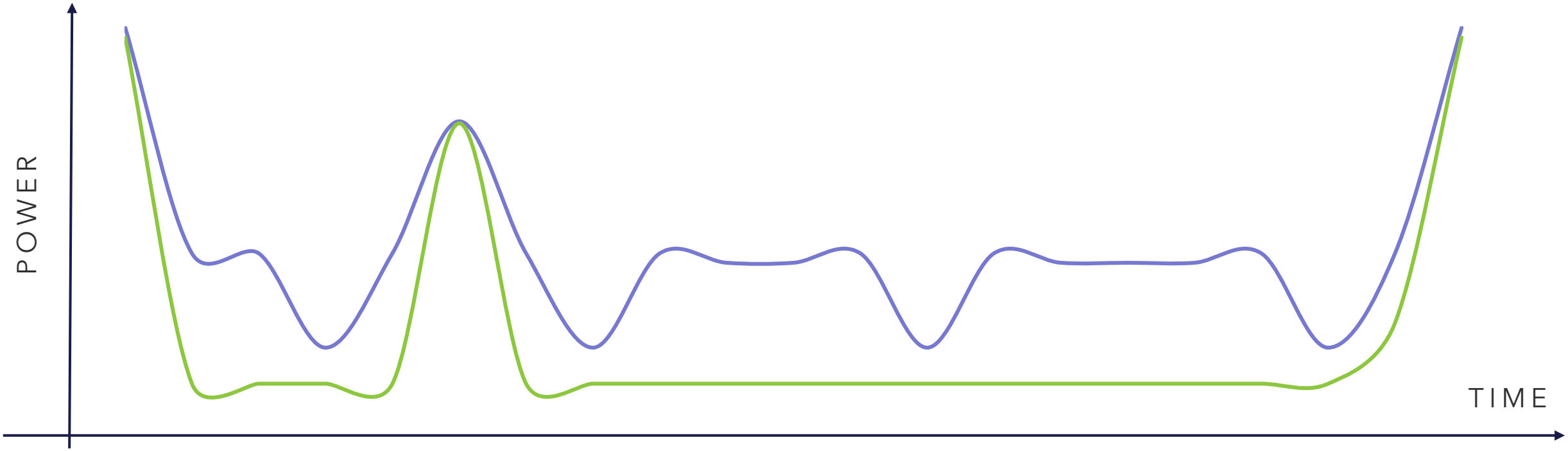
Controller Output — *Present Value* — *Past Value* — *Derivative Value* — *Precursor Value*



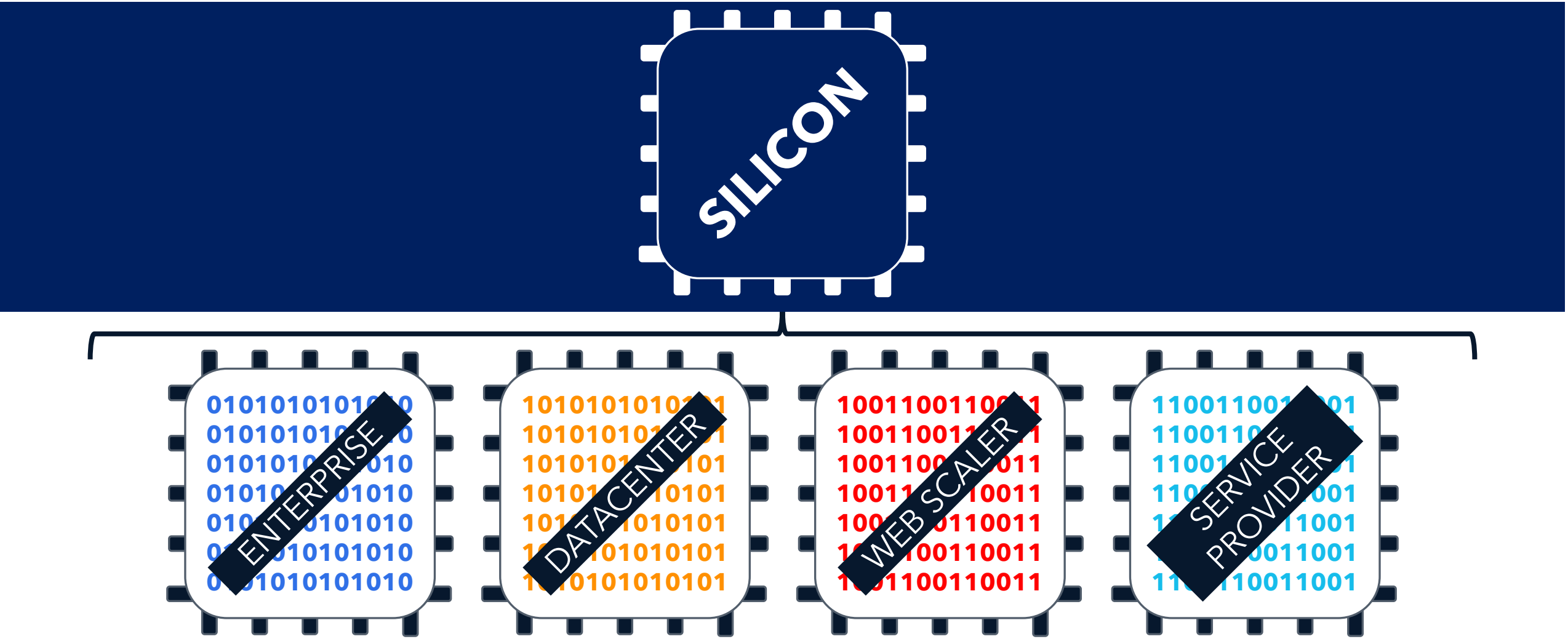
Precursor Proportional Integral Derivative

$$u(t) = K_p e(t) + K_i \int_0^t e(\tau)\,d\tau + K_d \frac{de(t)}{dt} + K_u \frac{dU(t)}{dt}$$

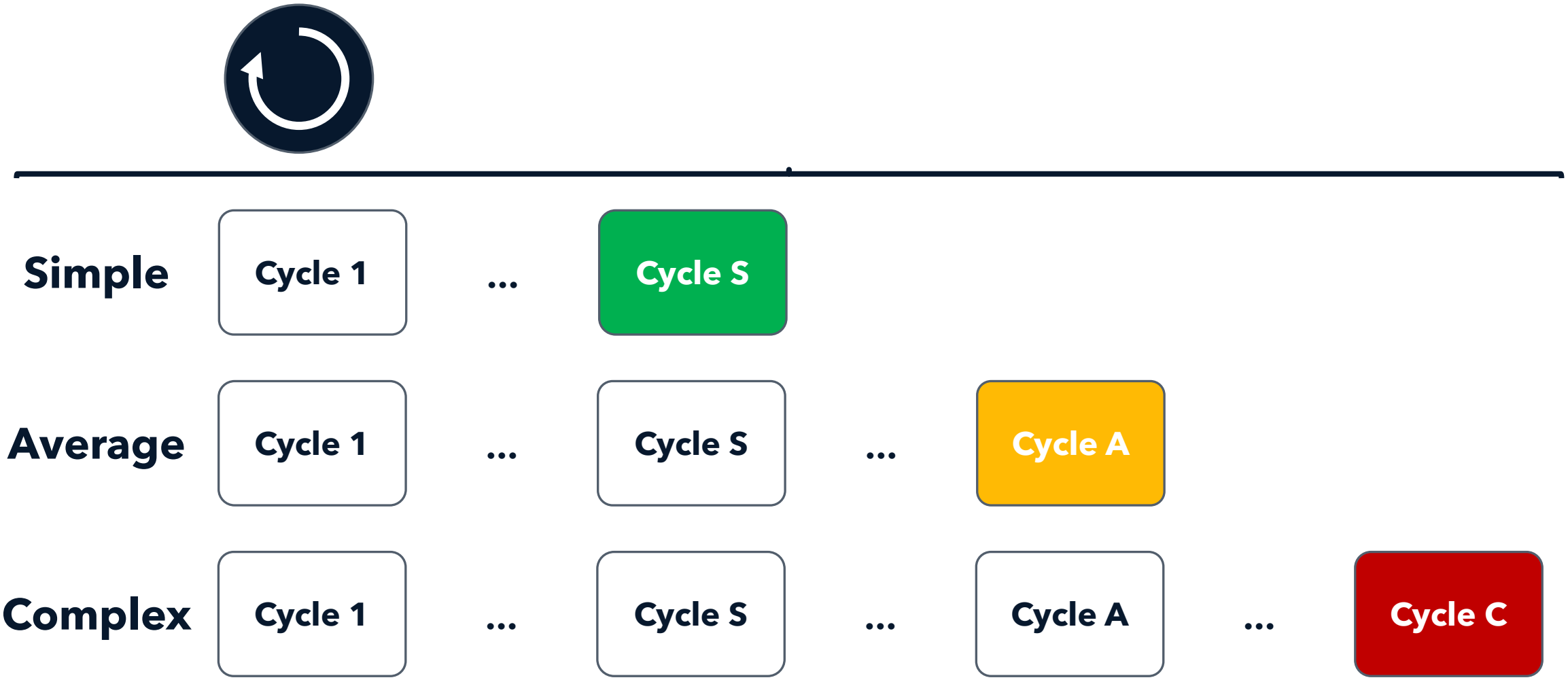
Controller Output | *Present Value* | *Past Value* | *Derivative Value* | *Precursor Value*



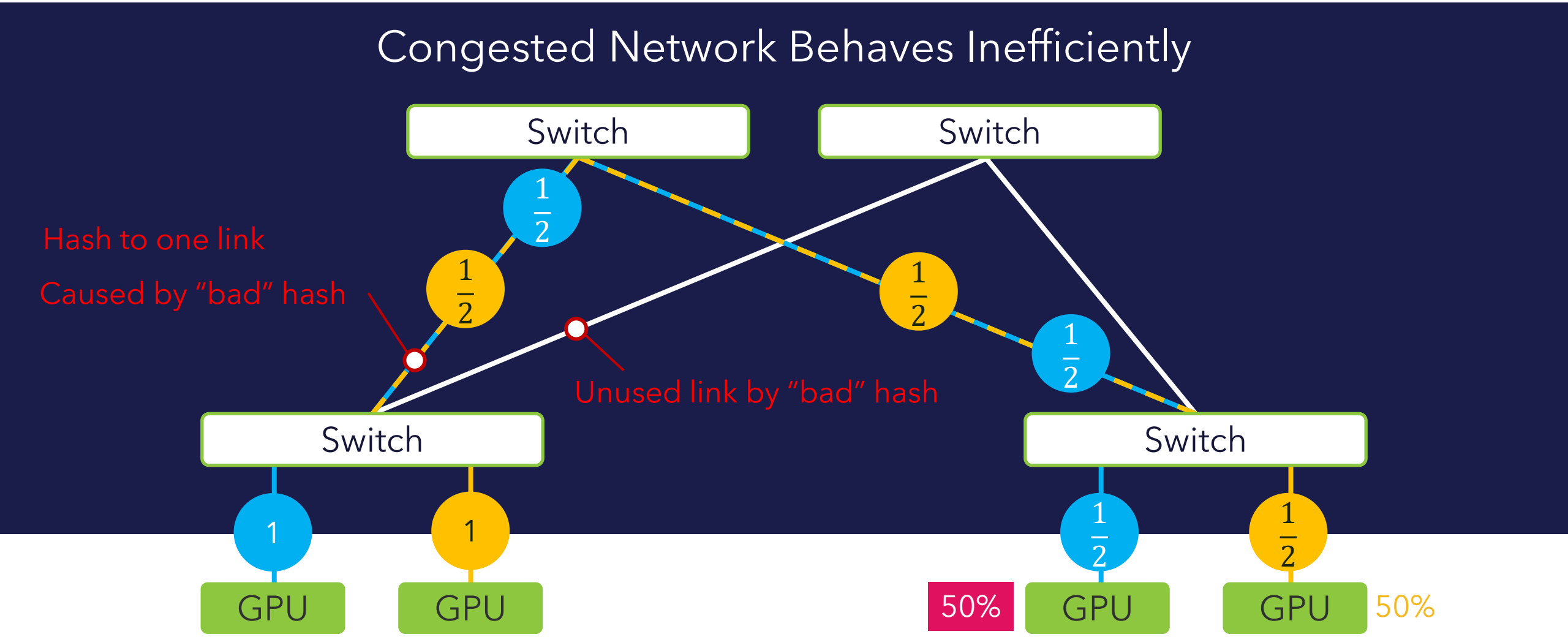
Programmable Silicon



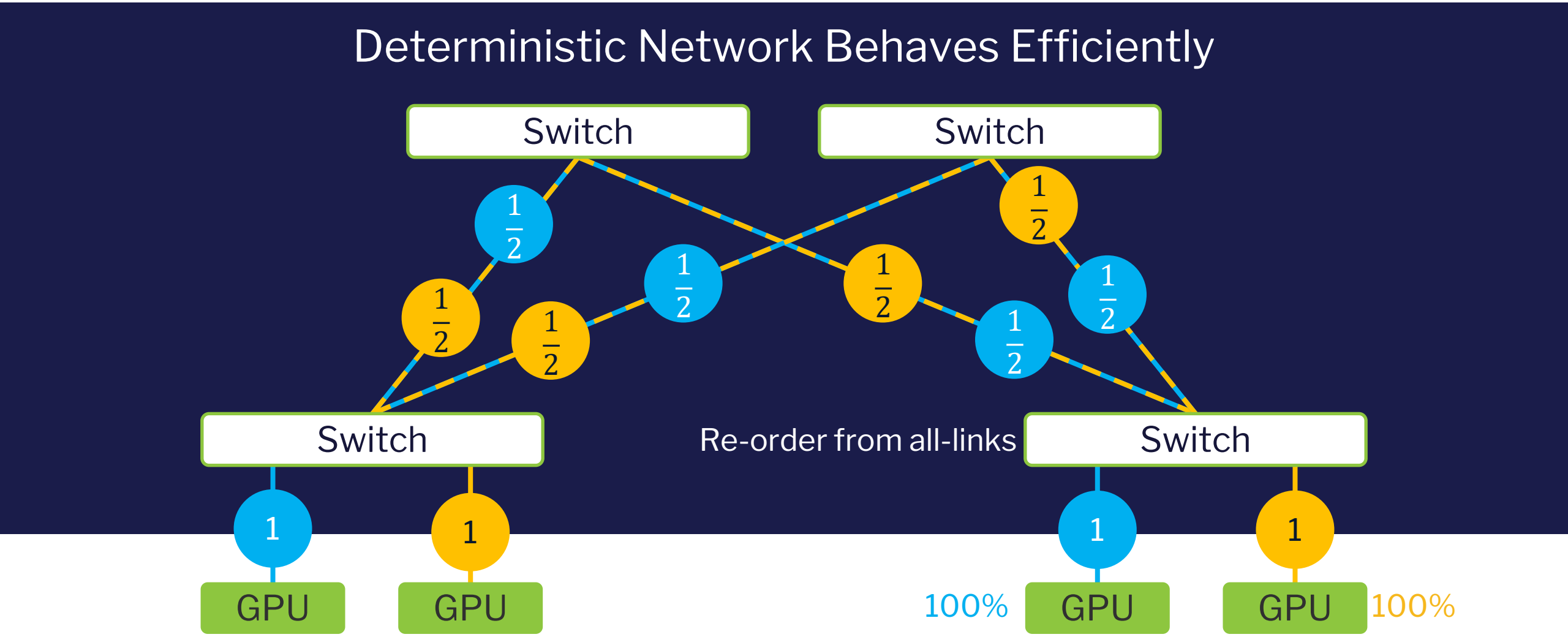
Run to Complete Silicon



Traditional Fabric

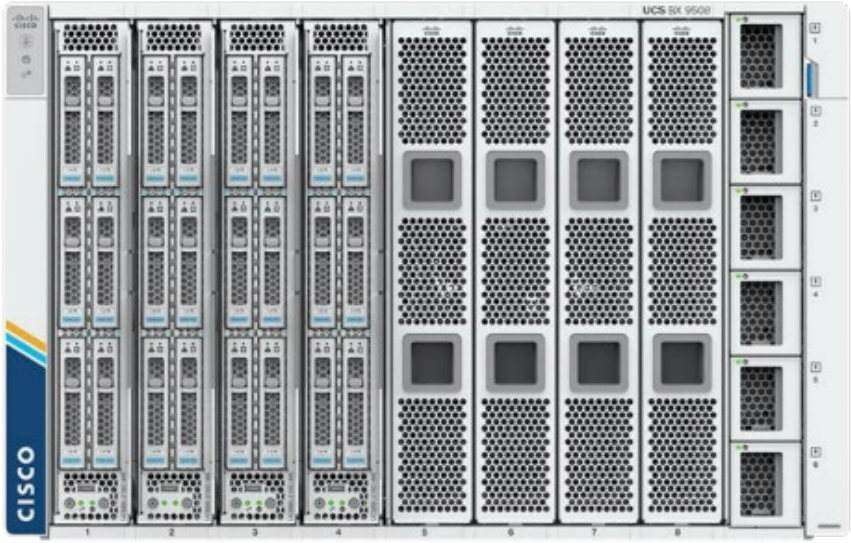


Schedule Fabric

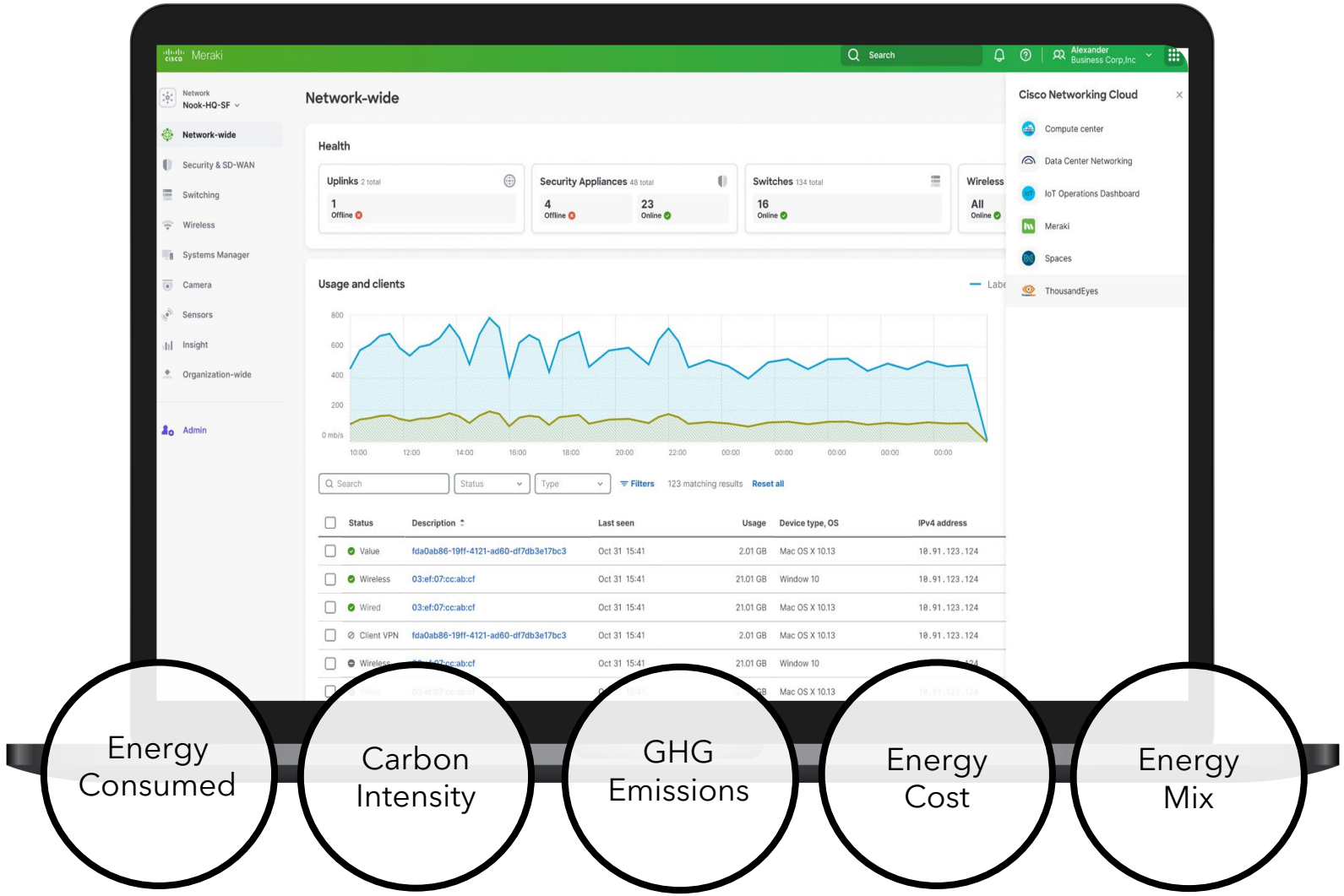


Converged Fabric Design

Legacy Rack	UCS X-Series
48 BMC Management Cables	24 Chassis 100G cables
96 DP Ethernet Cables	48 Chassis Optics
96 FC Cables	
384 Optics (4 ethernet, 4 FC)	
624 Total	72 Total



Energy Management Starts with Telemetry

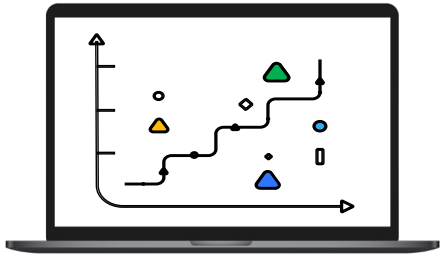


For illustration purposes only.

Transform with Telemetry

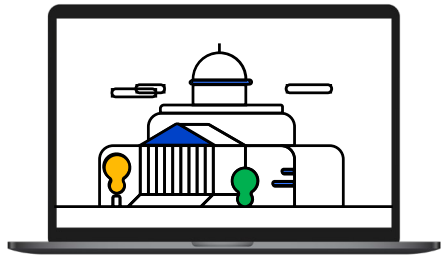
VISIBILITY

Energy consumption
Greenhouse Gas emissions
Carbon intensity
Energy mix
Energy cost



INSIGHT

Monitor
Baseline
Compare
Remediate



ACTION

OPEX savings
Reporting compliance
Future-ready architecture

AI Enterprise Factory

Security

Firewall
Secure workload
Robust
Intelligence

splunk>

AI frameworks	NVIDIA NGC, intel. Developer Cloud
AI management tools	NVIDIA, PyTorch
Virtualization and Kubernetes	OPENSHIFT
Infrastructure management	Nexus Dashboard, Intersight
AI Infrastructure	Nexus® Series | Nexus Dashboard; UCS Series | Intersight®

NVIDIA intel AMD COHESITY FlashStack FlexPod NUTANIX

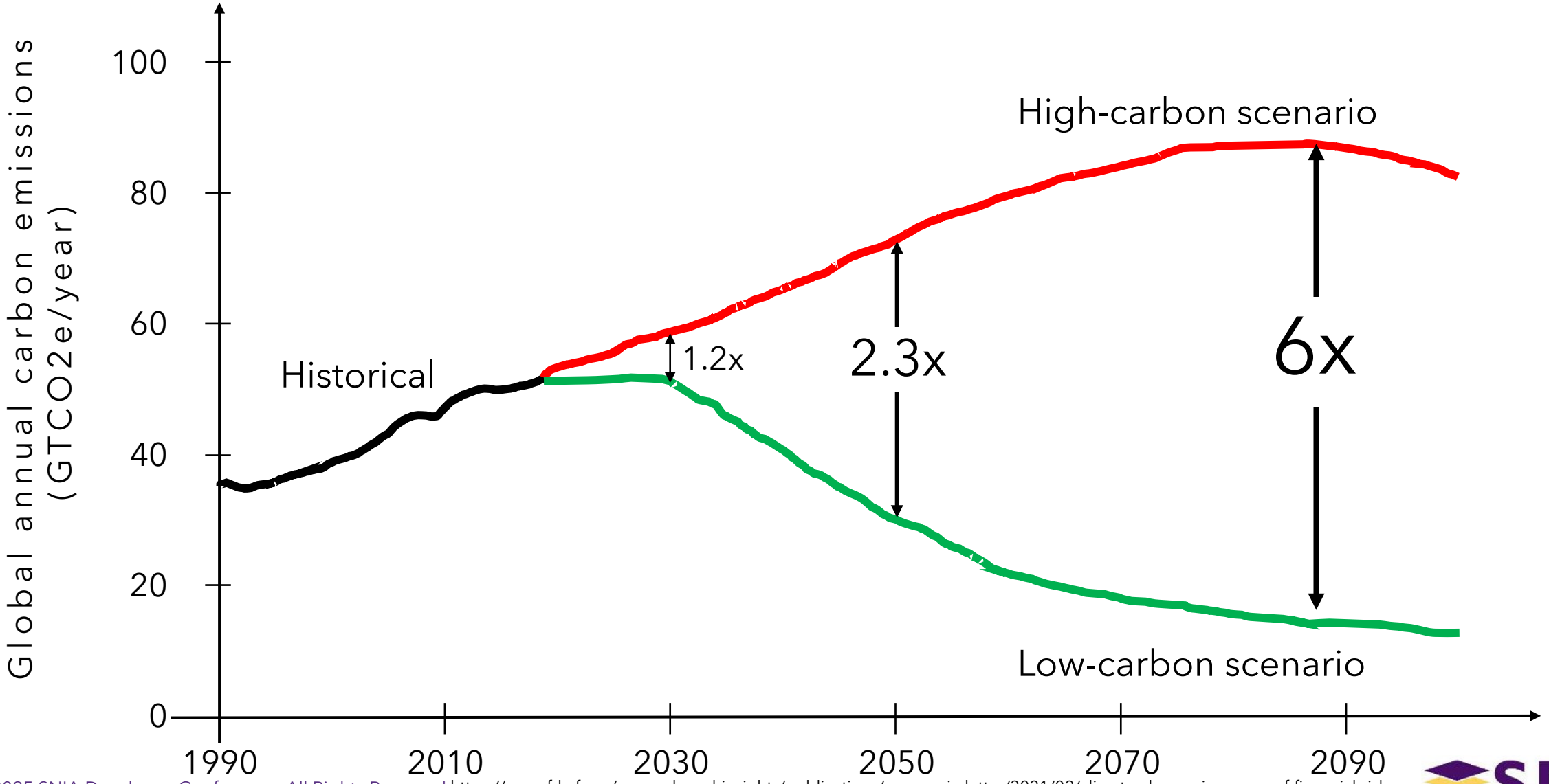
Observability

Observability
platform

splunk>

Data center | Edge | Colocation | Public cloud

Our Path Forward



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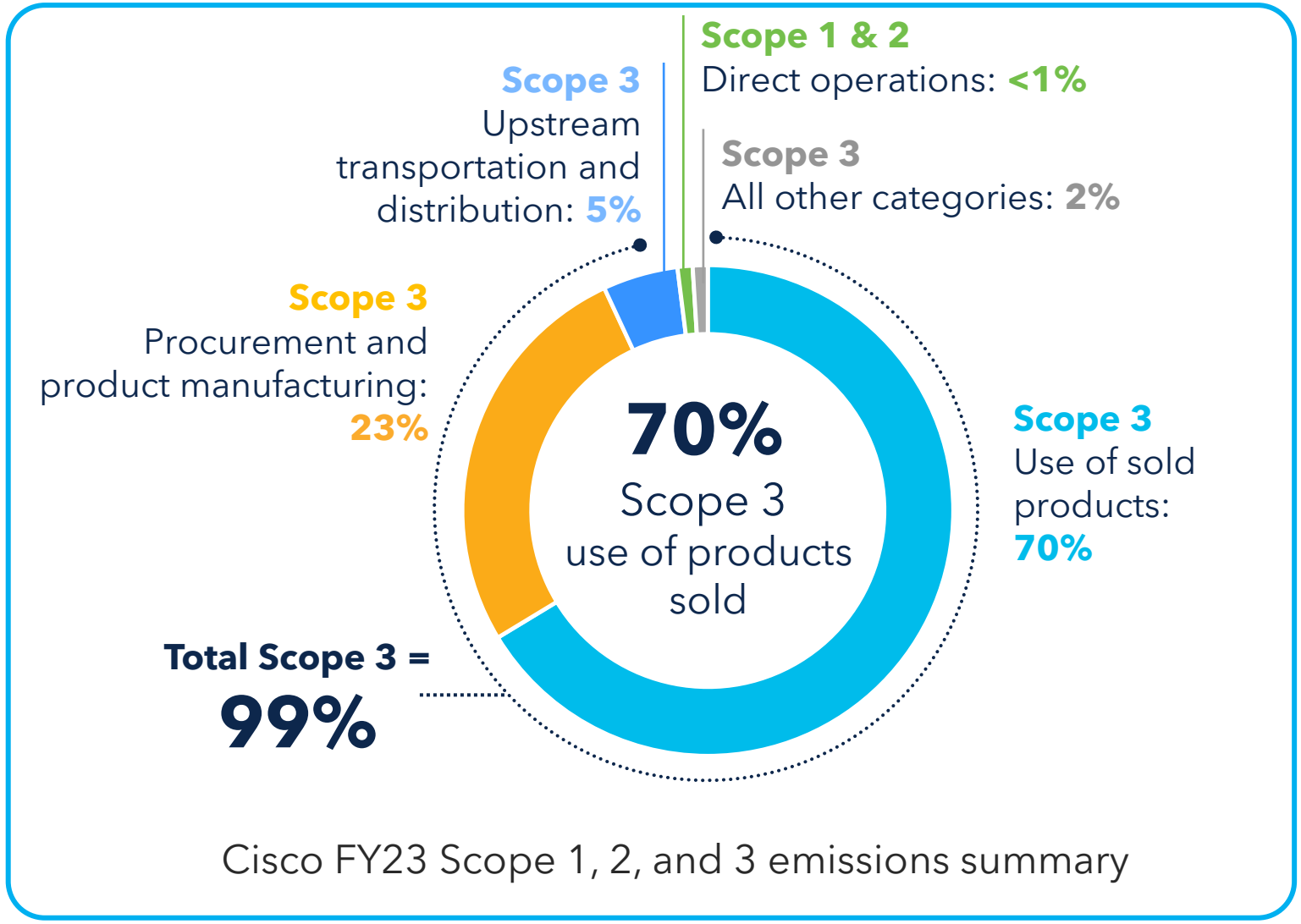
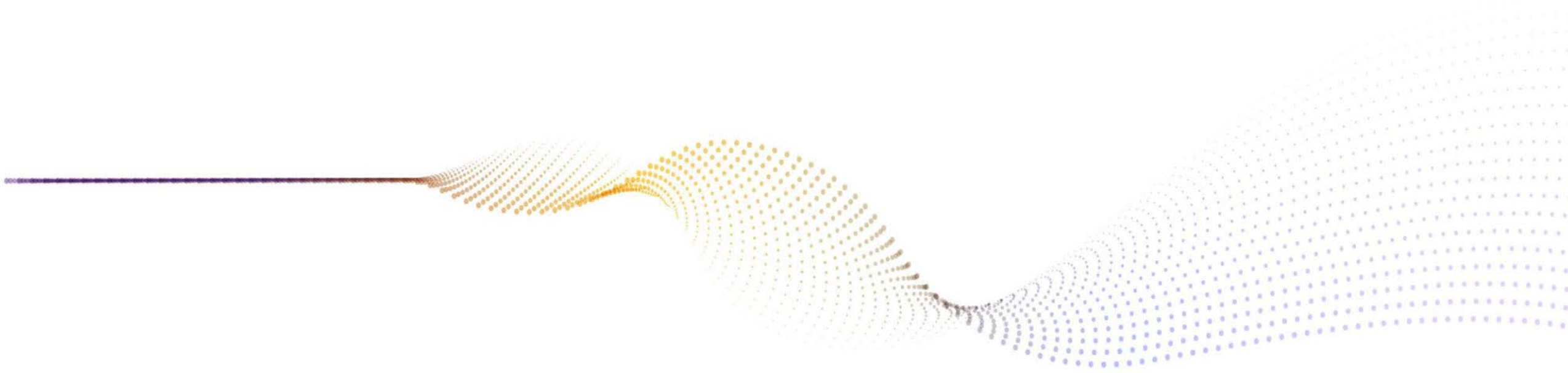
Advancing Our Goals

How we are planning to reduce Scope 3

- Improving product energy efficiency
- Collaborating with partners to increase renewable energy use
- Embedding circular design principles across our business
- Goal: 80% of our component, manufacturing, and logistics suppliers by spend to set a public absolute GHG emissions reduction target by FY25



Cisco FY23 Scope 1, 2, and 3 emissions summary



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